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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/665,798 | 09/18/2003 | Jeffrey D. Gelorme | YOR920030381US1 | 6144 |

7590 07/08/2005

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| EXAMINER |
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WALBERG, TERESA J

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| ART UNIT | PAPER NUMBER |
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3753

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,798

Applicant(s)

GELORME ET AL.

Examiner

Teresa J. Walberg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/18/03.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract should be amended to remove the phrase "the present invention" and the legal phraseology "comprises".

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 6, 8, 10, 12, 16-18, 26, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatata et al (5,365,402).

Hatata et al disclose a thermal interface used with an integrated circuit device (see Figs. 5 and 18) for facilitating heat transfer including a thermally

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conductive fluid (col. 5, line 15) including a liquid metal (col. 5, line 16), a flexible enclosure (33 or 37) for confining the thermally conductive fluid (col. 5, line 15), the enclosure including flexible metal foils (col. 5, line 14) sealed at their edges (see Figs 5 and 8), and the thermal interface (33, 37) being in thermal contact with a heat source (1) and a heat sink (17).

4. Claims 12, 17, 20, 24, 26, 28, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Mulhammar (2002/0088605).

Mulhammar discloses an integrated circuit device (see Figs. 2, 4, and 5c) for facilitating heat transfer including at least one heat source (101), at least one heat sink (113), at least one thermal interface (111) positioned between the heat source and heat sink, the thermal interface (111) including thermally conductive fluid (para. 0018, lines 1-3) in a flexible enclosure (111) for confining the thermally conductive fluid (para. 0018, lines 1-3), the enclosure including at least one flexible metal foil (para 0022) sealed around its perimeter edge to the heat sink (see Fig. 4), and the thermal interface (111) including a plurality of thermal interfaces (103 in Fig. 2) arranged in the form of an interposer.

5. Claims 12 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Sen et al (2004/0074630).

Sen et al disclose an integrated circuit device (see Figs. 4 and 6) including a at least one heat source (22), at least one heat sink (28), at least one thermal

interface (20) positioned between the heat source (22) and heat sink (28), the thermal interface (20) including thermally conductive fluid (32, para. 0029, lines 3-6) in a flexible enclosure (26) for confining the thermally conductive fluid (32), the enclosure (26) including at least one optimization layer (40) between the thermal interface (20) and the heat sink or the heat source, the layer being epoxy (para. 0037, lines 3-4).

6. Claims 1, 8-10, 12, 17, 18, 24, 26, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ulrich (4,563,375).

Ulrich discloses a thermal interface (Figs. 1 and 2) used with an integrated circuit device (see col. 4, line 4) for facilitating heat transfer including a thermally conductive fluid (18, col. 3, line 18), a flexible enclosure (14, 15) for confining the thermally conductive fluid (18), the enclosure including flexible metal foils (col. 3, line 19) such as aluminum (col. 2, line 4) sealed at their edges (see Fig. 2).

7. Claims 1, 2, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Danielson et al (4,997,032).

Danielson et al discloses a thermal interface (10) used with an integrated circuit device (see col. 4, lines 15-17) for facilitating heat transfer including a thermally conductive fluid (14), a flexible enclosure (10) for confining the thermally conductive fluid (14), the enclosure including a flexible liner (col. 6, lines 37-51).

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8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 11 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by or alternatively under 35 U.S.C. 103(a) as being unpatentable over Ulrich (4,563,375).

Ulrich, as discussed above, discloses the claimed structure with the exception of the enclosure being made by folding the foil before sealing around a perimeter edge. However, the product produced by this product by process step would appear to be substantially identical to that produced by placing together two sheets without folding. Alternatively, if the product is not considered to be the same, it would have been obvious to place two pieces of material together by folding one sheet in half before sealing, rather than by placing two separate sheets together, since using a folding process would reduce the number of sheets of material that would need to be handled.

10. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielson et al (4,997,032).

Danielson et al, as discussed above, discloses the claimed structure with the exception of the liner being formed of a chemically inert material. However, it would have been obvious to use a chemically inert material as one of the liner

layers of Danielson et al, the motivation being to prevent chemical reactions that could reduce the useful life of the thermal interface enclosure.

11. Claims 4, 5, 7, 21-23, 25, 27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatata et al (5,365,402) in view of Calmidi et al (6,665,186).


Hatata et al, as discussed above, discloses the claimed structure with the exception of a gasket or containment pad surrounding the perimeter edge of the enclosure and the liquid metal including gallium. Calmidi et al disclose an thermal interface used with an integrated circuit device (14), a thermally conductive fluid (18) including a liquid metal containing gallium (see abstract lines 1-2 and col. 5, lines 21-24), and a gasket or containment pad (10) surrounding the perimeter edge of the enclosure. It would have been obvious in view of Calmidi et al to provide a gasket or containment pad surrounding the perimeter edge of the enclosure of the thermal interface of Hatata et al, the motivation to better seal the area around the heat transfer fluid. It would have been obvious in view of Calmidi et al to use gallium as the liquid metal in the thermal interface of Hatata et al, the motivation to better transfer heat from the circuit component.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gilles, Berndlmaier et al, Tousignant, and Norell et al, are cited to show thermal interface structure.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa J. Walberg whose telephone number is 571-272-4790. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on 571-272-4930. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Teresa J. Walberg
Primary Examiner
Art Unit 3753.

tjw